

Running head: Oncology nurse stress-management

Title: A review of stress-management interventions for the oncology nursing workforce: what do we know and what should we be doing differently?

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Abstract

Oncology nurses are at risk of chronic stress. In this narrative review we provide an overview of stress-management intervention studies for oncology nurses, and suggest that Acceptance and Commitment Therapy/Training (ACT) provides a better intervention framework due to the relevance of underpinning therapeutic processes (e.g. acceptance, mindfulness, values clarification) to the role and stress-related experiences of this workforce population. Current evidence for stress-management intervention effectiveness varies, with few studies describing how theory informs intervention content, or justifying why they should benefit this population specifically. ACT lends itself to data-driven intervention development, thus potentially addressing some methodological limitations in this field. Only one trial has tested ACT in this population, reporting only partial effects. Further empirical research is required given (a) the applicability of ACT for this population and context, and (b) the associated advantages of brief and/or group delivery to address known barriers to participating in stress-management interventions.

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Introduction

The oncology setting is a stressful environment for patients, their families, and healthcare professionals (Jones et al., 2013). Oncology care staff include (but are not limited to): oncologists, radiotherapists, social workers, clinical psychologists, and registered nurses with advanced practice in oncology (oncology nurses). Although each of these groups is at-risk of work-related stress (Jones et al., 2013), this review focuses specifically on oncology nurses. The day-to-day role of oncology nurses varies significantly, from prevention to symptom management, acute care to palliative care, and treatment to rehabilitation (Wyatt & Hulbert-Williams, 2015). Given the diversity of this role, challenging and unpredictable situations occur frequently, often leading to the experience of occupational stress (Jones et al., 2013).

Important concepts in occupational wellbeing

‘Occupational stress’ encapsulates various psychological concepts such as burnout, secondary post-traumatic stress, vicarious traumatisation, and compassion fatigue. Burnout and compassion fatigue are most commonly reported in this population and at high prevalence levels (Domagala & Gaworska-Krzemińska, 2018; Gomez-Urquiza et al., 2016; Inmaculada De la Fuente-Solana et al., 2020). *Burnout* results from consistent exposure to elevated work-related stress, and is described as consisting of three factors: (i) emotional exhaustion (i.e. a state of being psychologically drained due to exposure to consistent stress), (ii) depersonalisation (i.e. a cynical approach towards the caring role) and (iii) reduced personal accomplishment (i.e. feeling less effective when caring for patients) (Maslach, 1982). *Compassion fatigue* or the ‘cost of caring’ (Figley, 1995), refers to the reduction of compassion (i.e. sympathy towards the suffering of others, creating a desire to help) over time, and an increase in hopelessness with regards to carrying out a caring role. This is mainly due to caring

for and constantly witnessing patients go through life-limiting illnesses and trauma (Joinson, 1992).

High levels of burnout and compassion fatigue have been reported globally in this population (Cheng et al., 2015; Hooper et al., 2010; Potter et al., 2010; Sherman et al., 2006). Out of 153 oncology nurses in Potter et al.'s study (2010), 37% of inpatient staff reported experiences of compassion fatigue, and 44% reported high levels of burnout. Emotional exhaustion was high in Kutluturkan et al.'s (2016) sample of 140 oncology nurses, and, similarly, in a third of Guveli et al.'s (2015) Turkish sample (n=159). A study of 216 American hospice nurses reported that around 80% of the sample were at high-risk of compassion fatigue (Abendroth & Flannery, 2006). Oncology nurses have reported higher levels of burnout and compassion fatigue compared to other specialties such as emergency, intensive care, and nephrology nurses (Hooper et al., 2010; Ortega-Campos et al., 2020).

What are the causes and consequences of burnout and compassion fatigue for this workforce?

Barnard and colleagues (2006) list 50 stressors specific to the oncology setting, with a prevalence rate of over 50% within their sample of 101 oncology nurses. Significant positive correlations were found between those stressors and both emotional exhaustion and depersonalisation scores. High workload/caseload (Sherman et al., 2006; Wazqar, 2018), low job autonomy (Escot et al., 2001), emotional demands of patients and their families (Isikhan et al., 2004; Wazqar, 2018), constantly dealing with illness and death (Ekedahl & Wengström, 2007; Florio et al., 1998), and difficult communication with patients (Corner, 2002) all serve to increase oncology nurse stress. These are further exacerbated by the pressures stemming from the current coronavirus pandemic (Abratt, 2020). Recurrent experiences of these stressors

further increase risks of burnout and/or compassion fatigue (Alacacioglu et al., 2009; Barnard et al., 2006; Corso, 2012).

Aware of these issues, oncology nurses have devised various coping strategies such as peer support, relaxation methods, personal/group reflection sessions, and positive personal/professional relationships (Florio et al., 1998; Huock, 2014; Wenzel et al., 2011). As with many groups of highly stressed people, certain coping methods can be more damaging to health. The use of alcohol and other substances to reduce stress has been reported in this population (Wallace et al., 2009), which have negative implications for work productivity and the individual's physical and psychological health. Other problematic consequences can include increased absenteeism (van Mol et al., 2015), and in many cases, highly stressed staff leaving their job prematurely (Bourdeanu et al., 2020; Wells-English et al., 2019), further increasing the problematic nurse shortage (Barrett & Yates, 2002). Consequently, staff shortages have a knock-on effect on job satisfaction and burnout in oncology nurses (Toh et al., 2011).

Support packages and interventions to reduce stress are essential to good organisational functioning, but previous work suggests that oncology nurses are not provided with sufficient opportunities to participate in these, especially for compassion fatigue (Aycock & Boyle, 2009). Occupational health settings are increasingly emphasising preventive initiatives in the workplace. In the UK context, for example, there has been promotion of psychological health in National Health Service (NHS) staff in recent years (Boorman, 2009). Efforts to better understand predictors and experiences of chronic stress in oncology nurses is vital to this effort, as they can negatively impact on the standard and safety of patient care (Kumar & Bhalla, 2019; Zadeh et al., 2012).

Within the occupational stress literature, intervention packages can be categorised based on whether they are person-specific or organisational in nature (Reynolds, 2000). Person-specific interventions address those stressors specific to the individual, and the coping strategies used to combat these. Organisational packages target different aspects of work structure, such as teamwork, managerial responsibilities, caseload distribution, health and safety, and promotion of work-life balance.

A previous review of stress-management interventions for general nursing samples (Mimura & Griffiths, 2003) identified that few intervention programmes are based on theoretically-derived models or developed in response to specific stressors faced by nurses. They emphasise that future research should provide conceptual clarity about how and why interventions are developed. This is important context in considering our review of the interventions which follow. To our knowledge, there is currently no detailed review of oncology nurse stress-management interventions: we propose that such a review is especially important if we are to develop effective, theoretically-driven interventions for this population. In undertaking such a review, we aim particularly to explore how Acceptance and Commitment Therapy/Training (ACT) may be a viable theoretical framework – as an alternative to the existing evidence base – given its conceptual fit and broader evidence base.

Review methods

We undertook a narrative review of stress-management intervention research in oncology nurses published over the past 15 years. Criteria for article inclusion was stipulated that the work had to be: (i) empirically-based (i.e. testing the effectiveness of an intervention), (ii) inclusive of a target sample of oncology nurses, and (iii) in the context specifically of occupational stress-management outcomes. Nine empirical studies were, thus, identified. These studies were organised and discussed according to the type of intervention (i.e.

educational or psychotherapeutic). Despite the prevalence of stress, surprisingly, few intervention studies have been recently published.

The second half of this paper offers a narrative review of the ACT framework and its potential utility for oncology nurse stress-management. Additional literature on the use of ACT in different populations is provided to supplement this work.

Interventions targeted at improving oncology nurse stress-management

Using Reynold's (2000) dichotomy, published studies in the oncology nursing setting appear to use person-specific approaches (e.g. educational workshops, team-based development programs, and psychotherapeutic approaches), typically in group-format delivery. This is likely due to the feasibility and cost efficiency of person-specific packages over organisational approaches, of which the latter generally require more resources and changes to infrastructure (Reynolds, 2000).

Intervention effectiveness: what does the current evidence demonstrate?

Table 1 provides the key details from the studies investigating stress-management interventions for oncology nurses. Onan et al. (2013) and Udo et al. (2013) both tested group-based educational interventions, reporting improvements in work-related stress levels, with Onan et al.'s (2013) participants also reporting significantly improved levels of emotional exhaustion post-training. Only the effects on work-related stress were maintained to one-month follow-up, but unfortunately no control condition was included for comparison in Onan et al.'s study design. For Udo et al.'s (2013) findings, the decreased stress levels were related to workload and less feelings of disappointment at work, but the effects were not statistically significant. Le Blanc et al. (2005) and Kravits et al. (2010) also used education-based interventions to target reduction in emotional exhaustion and depersonalisation. Both studies reported significant improvements in both outcomes, but only Le Blanc et al.'s (2005) study reports medium to

Table 1. Intervention studies investigating stress-management for oncology nurses.

Author (year)	Country	Design	Participants; Sample size (n)	Intervention information	Control group (YES/NO)	Assessment information (including time frames)	Effect size interpretation
Onan et al. (2013)	Turkey	Quasi-experiment	Oncology nurses; n=30	Coping skills intervention; nine 90-minute sessions	NO	Outcomes: stress, ways of coping, and burnout. (Pre and post-intervention, 1-month follow-up)	Not reported
Udo et al. (2013)	Sweden	Mixed-methods quasi-experiment	Oncology nurses; n=42	Educational intervention on existential issues; five 90-minute sessions	YES - non-educational group	Outcomes: Attitudes towards caring for patients feeling meaningless scale, sense of coherence scale. (Post-intervention and 6-month follow-up)	Not reported
Le Blanc et al. (2007)	Netherlands	Longitudinal quasi-experiment	Physicians, oncology nurses, radiotherapy assistants; n=664	Team-based burnout program targeting various concepts (e.g. decision making, social support, problem solving); six monthly 3-hour sessions	YES - received no intervention at all.	Outcomes: Burnout (emotional exhaustion and depersonalisation), social support, decision making participation, job control, job demands. (Pre and post-intervention, 6-month follow-up)	Small negative relationships ($B = -0.06$ to -0.18) between all outcomes, apart from a medium to high positive association between workload and emotional exhaustion

Oncology nurse stress-management

Kravitz et al., (2010)	USA	Mixed-methods	Oncology nurses; n=248	One 6-hour psycho-educational program on self-care strategies	NO	Outcomes: burnout, Draw-a-Person-in-the-Rain Art Assessment (PIR) to measure interaction between stressors and coping resources to augment burnout scores. (Pre and post-intervention)	Not reported
Potter et al. (2013)	USA	Descriptive pilot study	Oncology nurses; n=14	Compassion fatigue resiliency program; four 90-minute sessions	NO	Outcomes: Burnout, compassion fatigue, impact of events, nursing job satisfaction. (Pre and post-intervention, 3 and 6-month follow-ups)	Not reported
Cohen-Katz et al. (2005)	USA	Randomised-controlled trial	Oncology nurses; n=27	Mindfulness Based Stress Reduction; eight weekly 2.5 hour sessions	YES – waitlist condition	Outcomes: Burnout, emotional exhaustion, psychological distress. Process measure: Mindfulness Attention Awareness Scale. (Pre, and post-intervention, 3-month follow-up)	Not reported
Duarte & Pinto-Gouveia (2016)	Portugal	Non-randomised controlled study	Oncology nurses; n=48	Mindfulness Based Stress Reduction; six weekly 2-hour group sessions	YES – waitlist condition	Outcomes: Professional quality of life; depression, anxiety and stress; self-compassion. Process measures: psychological	Medium to large effects (<i>d</i> values not presented in the paper) on stress, burnout

Oncology nurse stress-management

						inflexibility and mindfulness. (Pre and post-intervention, no follow-up)	and compassion fatigue
Villani et al. (2013)	Italy	Randomised-controlled trial	Oncology nurses; n=30	Stress Inoculation Training (SIT) through mobile phone application; 8 sessions over 4 weeks	YES - neutral video clips, presenting natural landscapes, without any narrative	Outcomes: stress, anxiety, coping and job content. (Pre and post measures after each session)	Not reported
Poulsen et al. (2015)	USA	Randomised-controlled trial	Radiation therapists and oncology nurses; n=70	One-day educational workshop on recovery-related self-care practices	YES - written-educational information only	Outcomes: recovery, satisfaction with self-care practices, perceived sleep quality. (Pre-intervention, then every week for a 6-week period)	Medium significant effects ($d = .72$ to $.77$) observed for all outcomes at six-week follow-up

high effects on emotional exhaustion being maintained at 6-month follow-up. Further, out of the education-based interventions in this review, only Le Blanc and colleagues (2005) include a wait-list control condition, allowing for their findings to account for regression to the mean and potential confounding variables. Kravits et al. (2010) do not provide an interpretation of the strength of the effect sizes, and both studies do not include process measures to examine whether their chosen intervention content is responsible for the reported changes in outcome scores. There were also post-intervention reports of reduced personal accomplishment in Kravits et al.'s (2010) study, which is surprising given that they improved scores of emotional exhaustion and depersonalisation. The authors note that this may be due to participants feeling more comfortable to report their true feelings of personal accomplishment post-intervention, leading to the observation of lower scores, though no supporting data (e.g. qualitative feedback) is presented to corroborate this claim. Compassion fatigue and burnout were the focus of Potter et al.'s (2013) research. Although scores in these outcomes improved post-intervention, and were further reduced at six-month follow-up, only compassion fatigue scores showed a significant improvement from baseline to six-month follow-up. No effect on burnout was observed at any time-point.

Taking a more psychotherapeutic stance, Cohen-Katz et al. (2005) tested a mindfulness-based stress-reduction intervention (MBSR), reporting significantly improved emotional exhaustion which maintained at the three-month follow-up. However, no significant improvement in depersonalisation was reported, implying MBSR has limited effects on this sub-construct within burnout. The clinical utility of the findings is also limited due to no effect sizes being reported in the study. Duarte and Pinto-Gouveia (2016) also tested MBSR and reported post-intervention effects on stress, burnout and compassion fatigue; effects were medium to large, but no longer-term follow-up was included in the study design. This can make one question the applied relevance of these findings (e.g. providing an arguably lengthy intervention to time-

limited nurses) due to no indication of maintenance. Interestingly however, Duarte and Pinto-Gouveia (2017) did later report that improvements in stress, burnout and compassion fatigue were statistically mediated by changes in psychological inflexibility; we will come on to the relevance of this finding shortly.

Villani et al. (2013) successfully improved anxiety levels and coping skills through a mobile phone delivered Stress-Inoculation Training intervention. Scores were not assessed at follow-up, but pre-to-post intervention improvements were statistically better than control participants. This study did not, however, include an explicit outcome measure of stress which seems a curious design choice given the focus of this work. Poulsen et al.'s (2015) study also lacks an explicit stress outcome measure(s), however, significant improvements were observed in recovery experiences (relating to relaxation, self-control, psychological detachment and mastery), satisfaction with general self-care practices (presumably physical and psychological self-care though this is not clear), and perceived sleep quality. Medium effect sizes across all outcomes were maintained at six-week follow-up. The applied relevance of these findings to oncology nurse stress-management specifically is, however, limited due to the selection of proxy outcomes.

In summary, the intervention studies described above and in table 1 have reported varied findings across a range of outcomes, but the overall picture is not an entirely clear nor conclusive one. Three out of the nine studies did not include measures that target important stress-related concepts (e.g. burnout and compassion fatigue) and so their applied relevance to stress-management remains somewhat ambiguous. From this sample of studies, psychotherapeutic interventions seem to produce the most promising results, and they are also methodologically stronger given that: (i) all of them include control groups in their design; (ii) interpretation of effect sizes is more frequently reported (2 out of the 4 studies presented effect sizes); (iii) none of the studies testing psychotherapeutic interventions report negative effects

(e.g. the reduced personal accomplishment scores observed in Kravits et al.'s (2010) educational intervention); and (iv), they generally include process measures to determine whether the intervention is performing as intended, allowing us to probe for the mechanisms leading to change in primary outcomes. This final point is particularly important in intervention research, especially in the current zeitgeist of process-based interventions (Hofmann & Hayes, 2018). However, even in these cases where improvements are observed, no follow-up in three out of nine studies (e.g. Duarte et al., 2016 and Villani et al., 2013) often renders us unable to conclude whether the reported salutary effects last beyond the intervention sessions.

Why ACT might be a helpful alternative

We were not surprised to find a small number of mindfulness-based intervention studies given that these have also been widely used for stress-management in non-oncology nursing populations (Craigie et al., 2016; Delaney, 2018; Foureur et al., 2013; Lomas et al., 2018; Mackenzie et al., 2006; Watanabe et al., 2019). However, previous research has found that mindfulness-based interventions may have limited long-term effectiveness for stress-management in general populations, and in some instances are equally as effective as other approaches such as relaxation programs (Chiesa & Serretti, 2009). An approach which builds on this limited effectiveness base, with the addition of other therapeutic processes as part of a broader intervention framework might, therefore, be a wise starting point. For example, creating a drive to want to manage stress via the appetitive function of values-based processes (e.g. clarifying the importance of self-care as a motivator to engage in stress-management behaviours), as seen in ACT (Hayes et al., 2011), may function to promote longevity of intervention effect by increasing engagement in stress-management skills (such as mindfulness) in the long-term. Mindfulness-based skills may produce short-term benefits, but commitment to values could make participants feel more inclined to engage with the skills beyond the training; a hallmark of long-term behavioural change. The appetitive nature of

values selected by clients make them intrinsically rewarding, thus engaging in values-congruent behaviours (e.g. self-care) would be reinforced and, over-time, become more fluent (Luoma & Platt, 2015). Values-based processes are not targeted in traditional MBSR, thus justifying the use of more complex, theoretically-grounded, intervention approaches.

ACT, being one such framework, is informed by Relational Frame Theory (Hayes et al., 2001), thus having a strong evidence base for including specific intervention components. ACT explores how verbal (thought) content and cognitions can maintain an individual's negative behaviour and thoughts. ACT has been investigated across many different contexts, including (but not limited to) therapy for psychopathology (Powers et al., 2009; Ruiz, 2010), interventions for health behaviour change (Forman et al., 2009; Heffner et al., 2003; Hernández-López et al., 2009; Lillis et al., 2009), and specific to this review, for stress in the workplace setting (Dahl et al., 2004; Flaxman & Bond, 2010b). Although ACT has been promoted as suitable for use in the cancer setting (Hulbert-Williams et al., 2015), its application typically focuses on patients rather than care staff.

ACT aims to promote *psychological flexibility*; the ability to fully contact the present moment, and the thoughts, feelings and emotions it contains in a non-judgemental manner, and to continue or alter behaviour in pursuit of values-based living (Hayes et al., 2011). Psychological flexibility is widely identified as crucial in the maintenance of healthy psychological wellbeing, especially within a work context (Lloyd et al., 2013; Puolakanaho et al., 2020). It is a means to overcome the detrimental effects of *experiential avoidance*—the attempt to avoid negative private events (e.g. feelings, emotions, thoughts etc.), even when doing so can lead to behavioural complications in the long-run (Hayes et al., 2011). Experiential avoidance is argued to both increase and maintain psychological distress, and negatively influence effective behavioural activation (i.e. engagement in activities which improve mood) (Kashdan et al., 2006).

Experiential avoidance is identified as a risk factor within the workplace and should be targeted in preventive interventions (Bond & Donaldson-Feilder, 2004). Significant medium positive correlations have been found between experiential avoidance and depersonalisation and emotional exhaustion in Spanish critical care nurses (Iglesias et al., 2010), and post-traumatic stress symptoms in palliative care staff (O'Mahony et al., 2015). The Experiential Avoidance in Caregiving Questionnaire (Losada et al., 2014) illustrates the awareness of this concept in the healthcare field. ACT is, therefore, recommended as a promising preventive strategy (Biglan et al., 2008), since the promotion of psychological flexibility is the key outcome. Nonetheless, ACT is not currently being widely used as a stress-management approach in oncology caregiving populations. In our scoping searches, we identified only one intervention study that tested ACT for oncology nurses. Habibian et al. (2018) delivered a group-based ACT intervention (four 1.5 hour sessions) to 60 paediatric oncology nurses and special disease nurses (intervention condition; n=30, control group; n=30) using a randomised controlled trial (RCT) design. The control group received 'communication skills' that were unrelated to ACT, but no further details on this content is provided. Significant improvements were found in job stress scores compared to controls, with these large effects being maintained at three-month follow-up. However, no significant improvements in burnout were found for either condition post-intervention. Surprisingly, no process measure was included making it impossible to determine whether the theorised intervention processes had a causal effect on the observed improvements in stress.

ACT can be presented visually using the 'Hexaflex' model (figure 1). To briefly summarise, six core processes are theoretically linked to one another with the aim of promoting psychological flexibility (Hayes et al., 2011). It is important to note that each core process is considered a positive psychological skill—a technique aimed at helping participants engage

with both positive and negative internal content to promote mental wellbeing—and not merely a method to avoid or reduce symptoms of psychopathology.

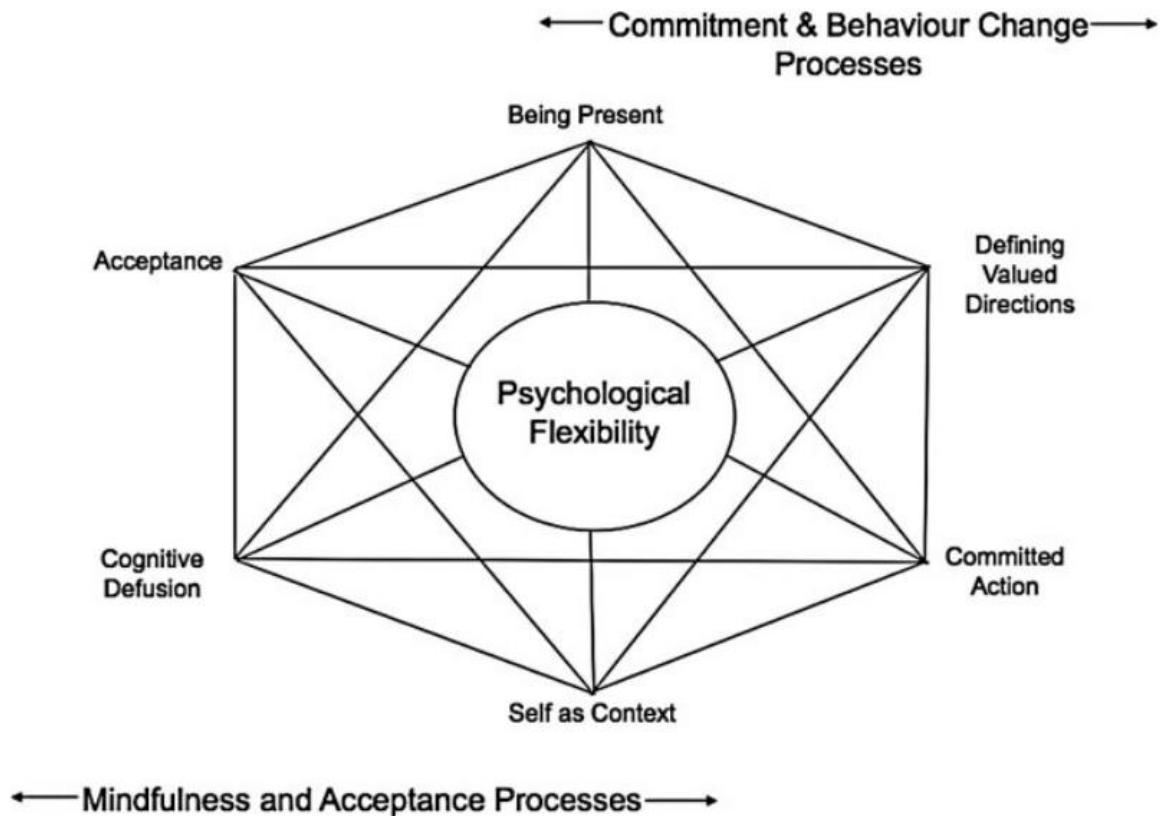


Figure 1. Acceptance and Commitment Therapy, illustrated using the Hexaflex model (adapted from Hulbert-Williams et al., 2015).

Cognitive defusion is defined as a process which allows an individual to create a context in which their present thoughts and feelings do not excessively regulate their actions or behaviour (Hayes et al., 2011). In a 'defused' state, goals and values can exert more control over behaviour, compared to a 'fused' state where emotional content exerts control over behavioural activation. For example, a nurse could narrate the different thoughts that flow through their mind after a difficult patient experience in order to create some 'psychological distance' between themselves and the thoughts. **Self-as-context** is an awareness of one's own experiences (past and present) without attachment to them; in a way, defusion applied to self-

concept. This allows an individual to understand their role as an observer to thoughts and emotions, rather than allowing these experiences to contain them and define self-concept (Hayes et al., 2011). One might use the ‘Classroom metaphor’ (Stoddard & Afari, 2014) to illustrate this, whereby the school classroom is the container of our different positive and negative internal content (depicted as pleasant and naughty students), as well as the critical or praising approach we have towards that content (i.e. the ‘teacher’ role). The classroom is the perspective we can take in self-as-context, whereby we are simply the vessel in which those experiences occur, allowing one to observe experiences without judgment.

Contact with the present moment through mindfulness training is central to ACT. Mindfulness is a process of purposely paying attention to the present moment (e.g. what a person can see, hear, touch etc.), including to those aspects of the human experience—thoughts, emotions and so forth. Often when we are feeling stressed, our cognitive attention is focused more on future worries or rumination over past experiences; our emotional state is tied to that worry in a subjectively appraised way that might bring distressing feelings of guilt or self-blame. Mindfulness training offers the ability to *know* when their conscious attention is not focused on present-moment experiences, and tools to then return it to that state of being in a non-judgmental manner (Kabat-Zinn, 1990). In ACT, mindfulness is a crucial skill to then allow for the training of an ***Accepting mindset***. Defined often as the opposite of experiential avoidance, this state of being is where we train clients to be fully accepting of present moment experiences, even when these might not be desirable. Mindfulness can often feel very easy when the content of the present moment is pleasant and desirable, but when internal content are more personally challenging, there is an increased drive towards experiential avoidance. Acceptance training offers techniques to appreciate that distressing psychological content is just as important to the human experience and should equally be approached and experienced in this non-judgemental manner (Hayes et al., 2011). In oncology nursing, this might involve

being open to and exploring not just the patient's distress regarding illness or death, but also noticing the distress that they themselves can experience.

Values are defined as “ongoing patterns of activity that are actively constructed, dynamic, and evolving” (Wilson et al., 2010, p. 252) that individuals can work towards, and which may facilitate goal setting. A common shared value for oncology nurses might be ‘compassion’, which provides an overarching purpose to the patient care they provide. At the technical level, values are verbally constructed ‘rules’ that motivate an individual to act in a way that is meaningful to them and are especially important in supporting continued action (rather than avoidance) in the state of psychological suffering. In a related psychological process, where an individual makes choices (day-to-day or larger life goals) in a way that is congruent with their personal values, they are more likely to recognise that their lives have ‘meaning’ (Plumb et al., 2009). After an individual clarifies values for different areas of their life, the final component of ACT is to train skills which encourage a client to pursue or ‘commit’ to specific actions (e.g. clearly communicating empathy in the presence of a distressed patient) that will help bring those values to life; a process called *committed action*.

Psychological flexibility and its relevance to the oncology nursing setting

Richardson et al., (2015) demonstrated the empirical link between cognitive fusion and self-compassion in USA-based medical students (n=52): a significant medium negative correlation was reported between cognitive fusion and self-compassion. By promoting cognitive defusion, therefore, ACT interventions have the potential to increase self-compassion, which is known to improve psychological health (Neff et al., 2007), and has relevance to healthcare settings by improving standards of patient care (Wiklund Gustin et al., 2013). In a similar, UK-based cross-sectional study, cognitive defusion negatively correlated with perceived stress, burnout and compassion fatigue, with moderate-to-strong effects, in a sample of 142 National Health

Service-based nurses (Kent et al., 2019). Furthermore, all of the ACT processes together accounted for large proportions of variance in perceived stress, burnout, compassion fatigue and compassion satisfaction (R^2 range = .36-.61), above and beyond that explained by demographic or work-related variables (e.g. relationship status or years or experience). Acceptance, mindfulness and values-based processes were frequent independent contributors to the variance explained in these chronic stress outcomes, highlighting their importance in nurse-focused stress-management interventions. Self-as-context was also significantly predictive of lower perceived stress, but was not a significant predictor for burnout or compassion fatigue. Despite this, self-as-context may still be an important stress-management component; for example, nurses who are fused with a self-as-content narrative that they *should* be able to cope with stress because they are caring and compassionate people (for others) may be more at-risk of suffering the negative effects of stress. Fusion with this self-content may consequently lead to minimisation of the stress experience or a reluctance to seek help, which, in the long-term, may elevate risks for chronic stress. Cognitive defusion techniques may help by providing separation between this self-as-nurse narrative, and the experiencing self in the present moment (i.e. noticing thoughts and feelings as a conscious stream of events and being guided by one's values). It is worth noting that relationships between therapeutic process predictors and these various outcomes likely have a temporal element: addressing levels of perceived stress first may in turn help to reduce risks of developing burnout and compassion fatigue, though this requires longitudinal investigation.

Acceptance has been reviewed in relation to coping strengths in informal caregivers of patients with terminal illness and dealing with bereavement (Davis et al., 2015); two issues relevant to the oncology setting. Davis and colleagues (2015) proposed an ACT-based model for volunteer caregivers specifically aimed at acceptance of unwanted thoughts/feelings associated with grief and fear of death, and addressing communication difficulties. Volunteer caregivers have been

found to report similar stressors to employed oncology nurses (Hulbert & Morrison, 2006), thus these ideas have applications to this population. Acceptance skills could help oncology nurses to engage in effective care and communication, even in the presence of their own and patients' suffering (Gomes et al., 2013). Where acceptance is lacking, nurses may instead avoid present-moment experiences of the more distressing parts of their job in the misguided assumption that this will reduce its vicarious effects. Given that this is a known risk factor for compassion fatigue development (Figley, 1995), intervention strategies that overcome this kind of experiential avoidance are hugely important.

Various research supports mindfulness as an effective component in nurse stress-management (Bazarko et al., 2013; Mackenzie et al., 2006). Cohen-Katz et al. (2005) and Duarte et al.'s (2016) studies reviewed previously demonstrate the utility of mindfulness for oncology nurses. Comparatively, a mindfulness-based intervention incorporating values-clarification exercises has been investigated for burnout, depression and post-traumatic stress in USA-based palliative care professionals (n=17; Gerhart et al., 2016). Significant reductions were found for depressive symptoms and depersonalisation, demonstrating large effect sizes, but no control group was included for comparison, and no follow-up was implemented to explore the maintenance of effect. Importantly, however, significant reductions in cognitive fusion and experiential avoidance were also present, providing tentative evidence for these processes as potential mechanisms of change. The importance of compassion identity in oncology nurses (i.e. evaluating internal coping resources for the stress of caring for the chronically ill and dying; Corso, 2012) has been examined with regards to mindfulness. From an ACT perspective, we might define this as using mindfulness skills to defuse from both fixed coping methods and a fused self-identity to develop self-as-context. Corso (2012) identifies mindfulness as crucial to an oncology nurses' role, as they require constant self-awareness and monitoring of their compassion identity. By freeing up an oncology nurse from 'fusion' and

allowing development of this compassion identity, not only may stress be reduced, but it may also allow an oncology nurse to attend to each patient's unique needs more effectively, improving the standard of care provided (Raab, 2014).

Cross-sectional research with Chinese oncology nurses reports that perceptions of a nurses' role being important and valuable is related to improved job satisfaction and lower scores of burnout (Cheng et al., 2015). This observation may be amplified through deliberate use of values clarification in intervention studies. Raingruber and Wolf (2015) assessed the unique role of oncology nursing, identifying three main themes involved in sustaining these health carers: (i) importance of vulnerability and thankfulness in patients, (ii) feeling of being spirituality associated with oncology nursing practice, and (iii) the value of being in the moment and recognising priorities as meaningful aspects of oncology nursing. These themes naturally align with an ACT-informed definition of values. A similar finding was reported by Van Rooyen et al. (2008): oncology nurses and their patient(s) were found to develop a special connectedness, requiring them to both approach death and illness directly. Doing this effectively requires the nurses to engage with this psychologically challenging content, and in doing so, might require reflection on their own values, meaning and purpose. Although often done for patient benefit, this psychological work might also benefit the oncology nurse by providing an additional stress-management coping mechanism (Van Rooyen et al., 2008).

ACT may, therefore, be even more suited to address chronic stress in oncology nurses compared to other purely mindfulness-based approaches (e.g. MBSR or Mindfulness-Based Cognitive Therapy) because of its added emphasis on values-driven behaviour. Values enable an individual to endure stress and other sources of psychological suffering (Bond et al., 2006), and so present a pertinent intervention target. In preventing compassion fatigue in oncology nurses, Corso (2012) suggests that interventions should train participants to "pay attention to the people and activities that nurture your mind, body and spirit. Commit to making time to

increase those interactions or activities.” (Corso, 2012, p. 449). Corso is not writing from a pro-ACT perspective, but the links between this quote and the committed action component within ACT are clear.

Based on this literature, we suggest that the core features of the ACT model make it highly relevant to the context and nature of the oncology nursing environment. Burnout prevention approaches which focus on the relationship between the individual and the situational stressor have long been considered as most effective (Maslach & Goldberg, 1998). ACT does so by modifying how an individual relates to their environment and experiences, rather than attempting to change or reduce the stressor. This is an important outcome goal given that the frequent stressors reported by this group are often not changeable; it thus makes sense to instead intervene on how one responds to (a) the presence and (b) the non-changeability of those stimuli (Blackedge & Hayes, 2001). This reconceptualization of stress appraisal offers a more workable approach compared to an ‘avoidant’ stance to dealing with stressful situations (Butts & Gutierrez, 2018), which are, in most cases, unavoidable as part of the job.

ACT implements a ‘unified model’ (Hayes et al., 2011), in that all of the components theoretically interact to increase psychological flexibility. Consequently, ACT protocols are likely more participant-friendly as each exercise or session naturally leads on to the other (e.g. the importance of firstly adopting an open and accepting approach to internal content in order to more effectively focus on the present moment; Flaxman et al., 2013). This allows for a more comprehensive understanding of the different stress-management skills which may help to avoid participant attrition (Richardson & Rothstein, 2008). Encouragingly, and perhaps consequently, a meta-analysis published last year reported that dropout rates were lower for ACT interventions (17.35%) compared to comparison conditions (18.62%) (Karekla et al., 2019). ACT has been widely developed in group and/or brief-format (Strosahl et al., 2012), for example, web-based interventions, and 1-2 hour workshops. This could be a suitable solution

for oncology nurses who regularly face barriers to research participation, such as workload (Roxburgh, 2006). ACT is amenable to delivery through coaching (e.g. skills training rather than ‘therapy’; Hulbert-Williams et al., 2016) which may make participation in interventions more acceptable and less stigmatising. Furthermore, there is now an abundance of process measures that allow for evaluation of the different components within intervention studies; of all available theoretical frameworks for psychological interventions, this model thus lends itself to a greater extent to high quality designs incorporating mediation and process-modelling of intervention components. Examples include the work-related Acceptance and Action Questionnaire (Bond et al., 2013) to measure psychological flexibility in a work context, or the Valued-Living Questionnaire (Wilson et al., 2010) to measure the values component.

ACT interventions for employee wellbeing in non-oncology healthcare settings

That there was only one study on ACT for oncology nurses surprised us. However, further rationale for the use of this framework can be found in the evidence in other organisational contexts (Bond & Bunce, 2000; Flaxman & Bond, 2010a; 2010b). Research in the healthcare professional setting is still limited, though there are relevant studies testing benefits for various groups in the caring professions. For example, using an observational design, Pakenham (2015) investigated cross-sectional correlations between ACT processes (values, acceptance, mindfulness, thought suppression) and adjustment outcomes (e.g. stress and psychological distress) in clinical psychology trainees (n=116): higher scores on acceptance and values measures, and lower scores on thought suppression, were each related to lower work-related stress (small effects) and psychological distress (small effects).

Two RCTs of ACT with qualified (O’Brien et al., 2019) and student nursing samples (Frögéli et al., 2015) reported significant reductions in mental health symptoms (medium effects), perceived stress (large effects), and burnout (large effects) when compared to both wait-list

and treatment-as-usual controls. The lengthy follow-up in Frögéli et al. (2015) allowed them to further demonstrate that improvements in perceived stress at one-year follow-up were significantly mediated by change in experiential avoidance during the intervention (i.e. from baseline to the end of the sixth session), indicating that effects lasted well beyond the training sessions (Frögéli et al., 2019). O'Brien et al. (2019) found that their nurses reported significantly fewer days (medium effect size) missed due to injury (e.g. musculoskeletal complaints), implying that ACT has potential positive implications on both the psychological and physical health of nurses.

Brinkborg et al.'s (2011) ACT RCT with 106 Swedish social workers found that, compared with wait-list controls, a significant difference was found in those participants who presented high stress at baseline (>25 on the Perceived Stress Scale), with 42% of the intervention condition reaching clinically significant change post-treatment (i.e. classified as 'recovered' and defined using a cut-off point supplemented by Swedish norm data on stress levels), compared to only 11.5% of the control group. This was coupled with statistically significant improvements in burnout and general mental health. Similarly, McConachie et al.'s (2014) study with intellectual disability support staff found significantly reduced distress (medium-to-large effects) and thought suppression (medium effects) in their ACT intervention participants compared to wait-list controls, with more pronounced effects being observed in those participants presenting higher psychological distress in baseline (i.e. six-weeks before post-intervention measures). These findings concur with Reeve et al.'s (2018) meta-analysis of ACT for burnout in mental health professionals, which concluded that ACT is particularly useful for those staff members that present high levels of distress in baseline. This means that, even for those participants at greater risk of chronic stress and other related variables (e.g. distress), ACT is likely to produce salutary effects of clinical significance.

Importantly, the use of ACT process measures allowed the researchers to examine whether intervention effects were mediated by changes in the underlying theoretical components being targeted. For example, Frögéli et al.'s (2015) study demonstrated that increases in psychological flexibility and mindfulness were distinctly predictive of decreases in perceived stress and burnout scores in their student nurse participants. McConachie et al. (2014) report a significant reduction in thought suppression between post-intervention and follow-up in their intervention group, facilitating decreased reduction in psychological distress. This latter finding is especially important as thought suppression is actively encouraged in some other intervention frameworks (e.g. traditional CBT approaches) suggesting that these may actually *increase* the risk of work-related distress.

Implications for future research

The stress-management interventions for oncology nurses discussed herein offer varied results, with the overall picture not being an entirely clear nor conclusive one. Psychotherapeutic interventions appear to provide the most promising results compared to educational approaches, in terms of efficacy and methodological robustness. A comprehensive review of this literature would not be complete without a critical review of methodology. Word-space precludes us spending too much time on this, however, there are some important limitations in previous work that are worth highlighting and considering for future study design.

Lessons to be learned: methodological limitations of current intervention studies

Firstly, the general under-reporting of effect sizes across the literature considerably hinders both the interpretation and applicability of intervention findings. Stress-management interventions aim to be both preventative and reactive. Thus, to effectively demonstrate these qualities, studies must report long-lasting intervention effect (i.e. robust effect sizes of clinical significance at follow-up). Such effects would imply that participants learn to use self-care

skills and incorporate them beyond the duration of the study; a hallmark of lasting behaviour change. However, we recognise that the interpretation of these effect sizes may be confusing due in part to the variability in reporting effect sizes, and the different (or lack of, e.g. Duarte & Pinto-Gouveia, 2016) follow-up periods and outcome measures which are incorporated across studies.

Control groups are an important quality indicator for intervention research (Street & Luoma, 2002). They can be used to (i) examine if an intervention affects a desired outcome beyond what would naturally occur over the course of the study; and (ii) to establish that changes in the outcome are not caused by extraneous variables associated with the participant (e.g. capability to deal with the problem, or readiness to change) (Street et al., 2002). Whilst some studies on stress-management for oncology nurses use control conditions, many tend to be either wait-list groups (Cohen-Katz et al., 2005; Duarte et al., 2016) or control groups which received no ‘intervention’ at all (e.g. Le Blanc et al., 2007). Some studies report greater effects in their intervention than the mere passage of time (i.e. a wait-list group), but it is often difficult to measure what specifically is happening for the control group, making comparisons between the conditions a difficult process. Only a small handful of studies reviewed here (e.g. Habibian et al., 2018; Poulsen et al., 2015; Udo et al., 2013; Villani et al., 2013) used active control groups—conditions which received ‘neutral’ exercises/sessions, often referred to as ‘psychosocial placebos’—and it is these studies which are able to demonstrate greater control over non-specific factors (e.g. therapist competence), thus concluding with more confidence that differences in observed outcomes between the groups are more likely due to the intervention effects (Street et al., 2002).

Intervention length is an important consideration too; attrition rates are typically higher in longer intervention studies, which can lead to potential bias, and have detrimental effects on the internal/external validity of results (Barry, 2005). In the current literature, many of the

studies report attrition rates (though Villani et al., 2013 did not), and most of these are relatively low (e.g. $n=4$ in Cohen-Katz et al., 2005), even when their intervention could be considered lengthy in this setting (eight 2.5 hour weekly sessions in Cohen-Katz et al.'s case). Some studies, however, do report higher attrition rates, which becomes especially problematic where baseline sample sizes are also small (e.g. Onan et al., 2013; Poulsen et al., 2015; Udo et al., 2013). Whilst explanations for their attrition rates are often provided, of which some cannot be controlled for (e.g. maternity leave, Onan et al., 2013), the majority is due to incomplete data sets and/or participants not completing all of the intervention sessions. This is likely due to busy work schedules (Walczak et al., 1994), which although reasonable, leaves little room for statistical control of these potentially confounding effects. This further emphasises a need for briefer intervention packages moving forward. ACT is useful in this context due to its versatility (e.g. group-based delivery; Walser and Pistorello, 2004) and ability to produce promising effects with intervention packages as brief as 1-2 hours (see Strosahl et al., 2012 for a detailed overview).

Many published interventions do not use (or clearly justify and explain) empirically validated principles or frameworks which inform intervention components. This is especially the case with educational interventions (e.g. Le Blanc et al., 2007, Poulsen et al., 2015 and Udo et al., 2013), compared with psychological interventions (e.g. Cohen-Katz et al., 2005 & Habibian et al., 2018). The former generally lack a detailed rationale for how that intervention package has been constructed (i.e. justification for why the different components and exercises are included in the protocols), an issue raised almost two decades ago that seems not to have since been improved (Mimura & Griffiths, 2003). Comparatively, Cohen-Katz et al. (2005) and Duarte and Pinto-Gouveia's (2016) use of MBSR is well described and justified through the presentation of MBSR's model, and previous evidence in similar populations. Of course, it is difficult to know whether this is a problem of the study design per se, or of word-limitation

imposed in journal reporting. As mentioned previously, ACT is an empirically validated framework (Hayes, 2016), with individually defined components which can be applied to numerous contexts and needs (i.e. a transdiagnostic approach; McHugh, 2011). This makes ACT a suitable method to address the issues previously raised by Mimura and Griffiths (2003). We recommend that future studies in this context appropriately describe how their ACT intervention is designed for the target population and needs.

In addition to reporting why certain intervention components are included, it is advantageous that study designs include measurement of process change to examine whether the intervention is affecting change in the way it is designed to. This knowledge further increases understanding of the components that possibly promote the effect, and which can be built upon in subsequent research to promote those aspects more effectively (Levin et al., 2012). Few published studies using educational intervention frameworks include such measures, which makes it difficult to confidently state whether the observed effects are due to the content of those interventions. In comparison, studies using psychological interventions generally provide a more data-driven approach to intervention design and testing. For example, Duarte et al. (2016) assess change in mindfulness using process measures and how this relates to outcome improvement (e.g. mediation analysis; Imai et al., 2010). This methodological approach concurs with the recent paradigm shift towards process-based therapy in intervention research (Hofmann & Hayes, 2018). Not assessing processes of change also impairs our ability to refine interventions over time, or to distil them to their most impactful components. Given the time pressures for intervention delivery, information as to which processes should be preferentially targeted would be valuable to maximise effectiveness. In this review, neither Villani et al. (2013) nor Habibian et al. (2013), who each tested psychotherapeutic interventions, included process measures. The latter case is especially surprising given the abundance of psychometrics offered by the ACT literature to assess process change (Levin et al., 2012). We therefore recommend

that all ACT-based research in employee stress-management ensures that validated process measures are included in their methodology.

To further illustrate the importance of specifying and measuring intervention components, a meta-analysis of 55 occupational stress intervention studies including over 2400 participants across various settings (including nursing and hospital contexts) found that cognitive-behavioural programs produced larger effects compared to other interventions, for example, relaxation and organisational interventions (Richardson & Rothstein, 2008). However, the authors concluded that the more complex and lengthier the intervention, and as more components are added, the poorer the improvement in stress, as this often confuses and overwhelms participants (Richardson & Rothstein, 2008). This therefore makes the tailoring of intervention content an important process. Previous research has found that participants perceive that tailored interventions make it easier to remember the information provided, allowing one to apply the techniques outside of the training environment more effectively (Ryan & Lauver, 2002). Nonetheless, the lack of intervention tailoring continues to permeate the literature. Habibian et al. (2018), for example, did not implement a tailored manual in their study but rather used an ACT intervention (Bach & Hayes, 2002) originally designed for hospitalisation prevention for patients diagnosed with psychosis to guide their content. This might have made it difficult for participants to understand how the ACT-based skills could be applied to their specific setting and experiences, which may, in part, explain the lack of effect on burnout scores observed in their study. Understanding the mechanisms of effect within an intervention allows one to develop tailored, data-driven interventions, and is a pertinent step in avoiding the issues raised above by Richardson and Rothstein (2008). In the context of nurse stress-management, our recent empirical research (****reference removed for anonymous peer review****) recommends that ACT interventions prioritise acceptance, mindfulness and values-

based processes as these appear to have the most potential in demonstrating beneficial effects for this population.

Whilst research investigates ACT interventions in this context, in the meantime we recommend that employers and health services use current psychotherapeutic stress-management interventions which are based on evidence stemming from methodologically robust research (e.g. those that include mediation analyses). In this context, mindfulness-based approaches are growing ever-popular, given the abundance of evidence in the MBSR literature, and are a viable starting point which can be further developed and optimised in the future (e.g. using ACT principles such as values-based living).

Conclusions

Given the prevalence of chronic stress in oncology nurse populations, there is a clear need for further research testing effective and acceptable interventions. The existing literature reports only a handful of studies which use validated psychotherapeutic models for effective stress-management, though it is these kinds of interventions that may produce more reliable, longer-lasting effects. It is plausible to assume that longer-term reduction of stress will act as a preventive strategy for decreasing future risks of burnout and compassion fatigue. Although ACT has only been tested once in an oncology nursing sample (Habibian et al., 2018), there is conceptual overlap with findings reported in the non-interventional, observational, theoretical modelling work undertaken in oncology nursing samples (e.g. Cheng et al., 2015; Corso, 2012; Gomes et al., 2013). We present a case in this paper that we believe supports the need for further intervention research using this framework, and we have highlighted important methodological limitations in the extant literature that should be considered in the design and implementation of these future studies.

Oncology nurse stress-management

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References

- Abendroth, M., & Flannery, J. (2006). Predicting the risk of compassion fatigue: A study of hospice nurses. *Journal of Hospice & Palliative Nursing*, 8(6), 346-356.
- Abratt, R. P. (2020). Patient care and staff well-being in oncology during the coronavirus pandemic—Ethical considerations. *South African Journal of Oncology*, 4, 1-3.
- Alacacioglu, A., Yavuzsen, T., Dirioz, M., Oztop, I., & Yilmaz, U. (2009). Burnout in nurses and physicians working at an oncology department. *Psycho-Oncology*, 18(5), 543-548.
- Aycock, N., & Boyle, D. (2009). Interventions to manage compassion fatigue in oncology nursing. *Clinical Journal of Oncology Nursing*, 13(2), 183-191.
- Bach, P., & Hayes, S. C. (2002). The use of acceptance and commitment therapy to prevent the rehospitalization of psychotic patients: a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 70(5), 1129-1139.
- Barnard, D., Street, A., & Love, A.W. (2006). Relationships between stressors, work supports, and burnout among cancer nurses. *Cancer nursing*, 29(4), 338-345.
- Barrett, L., & Yates, P. (2002). Oncology/haematology nurses: a study of job satisfaction, burnout, and intention to leave the specialty. *Australian Health Review*, 25(3), 109-121.
- Barry, A. E. (2005). How attrition impacts the internal and external validity of longitudinal research. *The Journal of School Health*, 75(7), 267-270.
- Bazarko, D., Cate, R. A., Azocar, F., & Kreitzer, M. J. (2013). The impact of an innovative mindfulness-based stress reduction program on the health and well-being of nurses employed in a corporate setting. *Journal of Workplace Behavioral Health*, 28(2), 107-133.
- Biglan, A., Hayes, S. C., & Pistorello, J. (2008). Acceptance and commitment: implications for prevention science. *Prevention Science*, 9(3), 139-152.
- Blackledge, J. T., & Hayes, S. C. (2001). Emotion regulation in acceptance and commitment therapy. *Journal of Clinical Psychology*, 57(2), 243-255.
- Bond, F. W., & Bunce, D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology*, 5(1), 156-163.
- Bond, F. W., & Donaldso-feilder, E. J. (2004). The relative importance of psychological acceptance and emotional intelligence to workplace well-being. *British Journal of Guidance & Counselling*, 32(2), 187-203.
- Bond, F. W., Hayes, S. C., & Barnes-Holmes, D. (2006). Psychological flexibility, ACT, and organizational behavior. *Journal of Organizational Behavior Management*, 26(1-2), 25-54.
- Bond, F. W., Lloyd, J., & Guenole, N. (2013). The work-related acceptance and action questionnaire: initial psychometric findings and their implications for measuring

- psychological flexibility in specific contexts. *Journal of Occupational and Organizational Psychology*, 86(3), 331-347.
- Bourdeanu, L., Zhou, Q., De Samper, M., Pericak, K. A., & Pericak, A. (2020). Burnout, workplace factors, and intent to leave among hematology/oncology nurse practitioners. *Journal of the Advanced Practitioner in Oncology*, 11(2), 141-148.
- Brinkborg, H., Michanek, J., Hesser, H., & Berglund, G. (2011). Acceptance and commitment therapy for the treatment of stress among social workers: A randomized controlled trial. *Behaviour Research and Therapy*, 49(6), 389-398.
- Boorman, S. (2009). *NHS Health and Well-Being Review*. Leeds, England: Department of Health. Retrieved from:
http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_108907.pdf.
- Butts, C. M., & Gutierrez, D. (2018). Using acceptance and commitment therapy to (re)conceptualize stress appraisal. *Journal of Mental Health Counseling*, 40(2), 95-112.
- Cheng, F., Meng, A. F., & Jin, T. (2015). Correlation between burnout and professional value in chinese oncology nurses: a questionnaire survey. *International Journal of Nursing Sciences*, 2(2), 153-157.
- Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis. *The Journal of Alternative and Complementary Medicine*, 15(5), 593-600.
- Cohen-Katz, J., Wiley, S. D., Capuano, T., Baker, D. M., & Shapiro, S. (2005). The Effects of Mindfulness-based Stress Reduction on Nurse Stress and Burnout, Part II: A Quantitative and Qualitative Study. *Holistic Nursing Practice*, 19(1), 26-35.
- Corner, J. (2002). Nurses' experiences of cancer. *European Journal of Cancer Care*, 11(3), 193-199.
- Corso, V.M. (2012). Oncology nurse as wounded healer: developing a compassion identity. *Clinical Journal of Oncology Nursing*, 16(5), 448-450.
- Craigie, M., Slatyer, S., Hegney, D., Osseiran-Moisson, R., Gentry, E., Davis, S., Dolan, T. and Rees, C. (2016). A pilot evaluation of a mindful self-care and resiliency (MSCR) intervention for nurses. *Mindfulness*, Vol. 7 No. 3, pp.764-774.
- Dahl, J., Wilson, K. G., & Nilsson, A. (2004). Acceptance and commitment therapy and the treatment of persons at risk for long-term disability resulting from stress and pain symptoms: A preliminary randomized trial. *Behavior Therapy*, 35(4), 785-801.
- Davis, E. L., Deane, F. P., & Lyons, G. C. (2015). Acceptance and valued living as critical appraisal and coping strengths for caregivers dealing with terminal illness and bereavement. *Palliative and Supportive Care*, 13(02), 359-368.
- Delaney, M.C. (2018). Caring for the caregivers: Evaluation of the effect of an eight-week pilot mindful self-compassion (MSC) training program on nurses' compassion fatigue and resilience. *PloS One*, 13(11), p.e0207261.

- Domagała, P. M., & Gaworska-Krzemińska, A. (2018). Stress and burnout among oncology nurses: review study. *Polish Psychological Bulletin*, 49(4), 482-488.
- Duarte, J., & Pinto-Gouveia, J. (2016). Effectiveness of a mindfulness-based intervention on oncology nurses' burnout and compassion fatigue symptoms: A non-randomized study. *International Journal of Nursing Studies*, 64, 98-107.
- Duarte, J., & Pinto-Gouveia, J. (2017). The role of psychological factors in oncology nurses' burnout and compassion fatigue symptoms. *European Journal of Oncology Nursing*, 28, 114-121.
- Ekedahl, M., & Wengström, Y. (2007). Nurses in cancer care—stress when encountering existential issues. *European Journal of Oncology Nursing*, 11(3), 228-237.
- Escot, C., Artero, S., Gandubert, C., Boulenger, J.P., & Ritchie, K. (2001). Stress levels in nursing staff working in oncology. *Stress and Health*, 17(5), 273-279.
- Figley, C.R. (Ed.). (1995). *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized*. New York: Brunner/Mazel.
- Flaxman, P. E., & Bond, F. W. (2010a). A randomised worksite comparison of acceptance and commitment therapy and stress inoculation training. *Behaviour Research and Therapy*, 48(8), 816-820.
- Flaxman, P. E., & Bond, F. W. (2010b). Worksite stress management training: moderated effects and clinical significance. *Journal of Occupational Health Psychology*, 15(4), 347-358.
- Flaxman, P. E., Bond, F. W., & Livheim, F. (2013). *The mindful and effective employee: An acceptance and commitment therapy training manual for improving well-being and performance*. New Harbinger Publications: Oakland.
- Florio, G. A., Donnelly, J. P., & Zevon, M. A. (1998). The structure of work-related stress and coping among oncology nurses in high-stress medical settings: a transactional analysis. *Journal of Occupational Health Psychology*, 3(3), 227-242.
- Forman, E. M., Butryn, M. L., Hoffman, K. L., & Herbert, J. D. (2009). An open trial of an acceptance-based behavioral intervention for weight loss. *Cognitive and Behavioral Practice*, 16(2), 223-235.
- Foureux, M., Besley, K., Burton, G., Yu, N., & Crisp, J. (2013). Enhancing the resilience of nurses and midwives: Pilot of a mindfulness-based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse*, 45(1), 114-125.
- Frögéli, E., Djordjevic, A., Rudman, A., Livheim, F., & Gustavsson, P. (2015). A randomized controlled pilot trial of Acceptance and Commitment Training (ACT) for preventing stress-related ill health among future nurses. *Anxiety, Stress, & Coping: An International Journal*, 29(2), 1-17. doi: 10.1080/10615806.2015.1025765.

- Frögéli, E., Rudman, A., & Gustavsson, P. (2019). Preventing stress-related ill health among future nurses: Effects over 3 years. *International Journal of Stress Management*, 26(3), 272-286.
- Gerhart, J., O'Mahony, S., Abrams, I., Grosse, J., Greene, M., & Levy, M. (2016). A pilot test of a mindfulness-based communication training to enhance resilience in palliative care professionals. *Journal of Contextual Behavioral Science*, 5(2), 89-96.
- Gomes, S. D. F. S., Santos, M. M. M. C. C., & Carolino, E. T. D. M. A. (2013). Psycho-social risks at work: stress and coping strategies in oncology nurses. *Revista latino-Americana de Enfermagem*, 21(6), 1282-1289.
- Gomez-Urquiza, J. L., Aneas-López, A. B., Albendín-García, L., & Díaz-Rodríguez, L. (2016). Prevalence, risk factors, and levels of burnout among oncology nurses: a systematic review. *Oncology Nursing Forum*, 43(3), E104-E120.
- Guveli, H., Anuk, D., Oflaz, S., Guveli, M. E., Yildirim, N. K., Ozkan, M., & Ozkan, S. (2015). Burnout, job satisfaction and coping with stress. *Psycho-Oncology*, 24, 926-931.
- Habibian, Z., Sadri, Z., & Nazmiyeh, H. (2018). Effects of group acceptance and commitment therapy-based training on job stress and burnout among pediatric oncology and special diseases nurses. *Iranian Journal of Pediatric Hematology and Oncology*, 8(2), 118-125.
- Hayes, S. C. (2016). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies—republished article. *Behavior Therapy*, 47(6), 869-885.
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. Springer Science & Business Media.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and commitment therapy: The process and practice of mindful change*. Guilford Press.
- Heffner, M., Eifert, G. H., Parker, B. T., Hernandez, D. H., & Sperry, J. A. (2003). Valued directions: Acceptance and commitment therapy in the treatment of alcohol dependence. *Cognitive and Behavioral Practice*, 10(4), 378-383.
- Hernández-López, M., Luciano, M. C., Bricker, J. B., Roales-Nieto, J. G., & Montesinos, F. (2009). Acceptance and commitment therapy for smoking cessation: a preliminary study of its effectiveness in comparison with cognitive behavioral therapy. *Psychology of Addictive Behaviors*, 23(4), 723-730.
- Hofmann, S. G., & Hayes, S. C. (2018). The future of intervention science: Process-based therapy. *Clinical Psychological Science*, 7(1), 37-50.
- Hooper, C., Craig, J., Janvrin, D. R., Wetsel, M. A., & Reimels, E. (2010). Compassion satisfaction, burnout, and compassion fatigue among emergency nurses compared with nurses in other selected inpatient specialties. *Journal of Emergency Nursing*, 36(5), 420-427.

- Houck, D. (2014). Helping nurses cope with grief and compassion fatigue: an educational intervention. *Clinical Journal of Oncology Nursing*, 18(4), 454-458.
- Hulbert-Williams, L., Hochard, K. D., Hulbert-Williams, N., Archer, R., Nicholls, W., & Wilson, K. (2016). Contextual behavioural coaching: An evidence-based model for supporting behaviour change. *International Coaching Psychology Review*, 11(2), 30-42.
- Hulbert, N. J., & Morrison, V. L. (2006). A preliminary study into stress in palliative care: Optimism, self-efficacy and social support. *Psychology, Health & Medicine*, 11(2), 246-254.
- Hulbert-Williams, N. J., Storey, L., & Wilson, K. G. (2015). Psychological interventions for patients with cancer: psychological flexibility and the potential utility of Acceptance and Commitment Therapy. *European Journal of Cancer Care*, 24(1), 15-27.
- Iglesias, M. E. L., de Bengoa Vallejo, R. B., & Fuentes, P. S. (2010). The relationship between experiential avoidance and burnout syndrome in critical care nurses: A cross-sectional questionnaire survey. *International Journal of Nursing Studies*, 47(1), 30-37.
- Imai, K., Keele, L., & Tingley, D. (2010). A general approach to causal mediation analysis. *Psychological Methods*, 15(4), 309-335.
- Inmaculada de la Fuente-Solana, E., Pradas-Hernández, L., Ramiro-Salmerón, A., Suleiman-Martos, N., Gómez-Urquiza, J. L., Albendín-García, L., & Cañadas-De la Fuente, G. A. (2020). Burnout syndrome in paediatric oncology nurses: a systematic review and meta-analysis. *Healthcare*, 8(3), 309-321.
- Isikhan, V., Comez, T., & Danis, M.Z. (2004). Job stress and coping strategies in health care professionals working with cancer patients. *European Journal of Oncology Nursing*, 8(3), 234-244.
- Joinson, C. (1992). Coping with compassion fatigue. *Nursing*, 22(4), 116-118.
- Jones, M. C., Wells, M., Gao, C., Cassidy, B., & Davie, J. (2013). Work stress and well-being in oncology settings: a multidisciplinary study of health care professionals. *Psycho-Oncology*, 22(1), 46-53.
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. New York: Delacorte.
- Karekla, M., Konstantinou, P., Ioannou, M., Kareklas, I., & Gloster, A. T. (2019). The phenomenon of treatment dropout, reasons and moderators in acceptance and commitment therapy and other active treatments. *Clinical Psychology in Europe*, 1(3), 1-36.
- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour research and therapy*, 44(9), 1301-1320.

- Kent, W., Hochard, K. D., & Hulbert-Williams, N. J. (2019). Perceived stress and professional quality of life in nursing staff: How important is psychological flexibility? *Journal of Contextual Behavioral Science*, 14, 11-19.
- Kravits, K., McAllister-Black, R., Grant, M., & Kirk, C. (2010). Self-care strategies for nurses: A psycho-educational intervention for stress reduction and the prevention of burnout. *Applied Nursing Research*, 23(3), 130-138.
- Kumar, M. Y. S., & Bhalla, P. (2019). Stress among nursing staff in hospitals and its relation with job satisfaction, job performance and quality of nursing care: a literature review. *Journal of Nursing and Care*, 8(3), 1-5.
- Kutluturkan, S., Sozeri, E., Uysal, N., & Bay, F. (2016). Resilience and burnout status among nurses working in oncology. *Annals of General Psychiatry*, 15(1), 33-42.
- Le Blanc, P. M., Hox, J. J., Schaufeli, W. B., Taris, T. W., & Peeters, M. C. (2007). Take care! The evaluation of a team-based burnout intervention program for oncology care providers. *Journal of Applied Psychology*, 92(1), 213-227.
- Levin, M. E., Hildebrandt, M. J., Lillis, J., & Hayes, S. C. (2012). The impact of treatment components suggested by the psychological flexibility model: A meta-analysis of laboratory-based component studies. *Behavior Therapy*, 43(4), 741-756.
- Lillis, J., Hayes, S. C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of the obese: a preliminary test of a theoretical model. *Annals of Behavioral Medicine*, 37(1), 58-69.
- Lloyd, J., Bond, F. W., & Flaxman, P. E. (2013). The value of psychological flexibility: Examining psychological mechanisms underpinning a cognitive behavioural therapy intervention for burnout. *Work & Stress*, 27(2), 181-199.
- Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., & Eiroa-Orosa, F. J. (2018). A systematic review and meta-analysis of the impact of mindfulness-based interventions on the well-being of healthcare professionals. *Mindfulness*, 10, 1193-1216.
- Losada, A., Márquez-González, M., Romero-Moreno, R., & López, J. (2014). Development and validation of the experiential avoidance in caregiving questionnaire (EACQ). *Aging & Mental Health*, 18(7), 897-904.
- Luoma, J. B., & Platt, M. G. (2015). Shame, self-criticism, self-stigma, and compassion in Acceptance and Commitment Therapy. *Current opinion in Psychology*, 2, 97-101.
- Mackenzie, C. S., Poulin, P. A., & Seidman-Carlson, R. (2006). A brief mindfulness-based stress reduction intervention for nurses and nurse aides. *Applied Nursing Research*, 19(2), 105-109.
- Marshall, E. J., & Brockman, R. N. (2016). The relationship between psychological flexibility, self-compassion, and emotional well-being. *Journal of Cognitive Psychotherapy*, 30(1), 60-72.
- Maslach, C. (1982). *Burnout: the cost of caring*. New York: Prentice-Hall.

- Maslach, C., & Goldberg, J. (1998). Prevention of burnout: New perspectives. *Applied and preventive psychology*, 7(1), 63-74.
- McConachie, D. A. J., McKenzie, K., Morris, P. G., & Walley, R. M. (2014). Acceptance and mindfulness-based stress management for support staff caring for individuals with intellectual disabilities. *Research in Developmental Disabilities*, 35(6), 1216-1227.
- Mimura, C., & Griffiths, P. (2003). The effectiveness of current approaches to workplace stress management in the nursing profession: an evidence based literature review. *Occupational and Environmental Medicine*, 60(1), 10-15.
- McHugh, L. (2011). A new approach in psychotherapy: ACT (acceptance and commitment therapy). *The World Journal of Biological Psychiatry*, 12(S1), 81-84.
- Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007). Self-compassion and adaptive psychological functioning. *Journal of research in personality*, 41(1), 139-154.
- O'Brien, W. H., Singh, R., Horan, K., Moeller, M. T., Wasson, R., & Jex, S. M. (2019). Group-based acceptance and commitment therapy for nurses and nurse aides working in long-term care residential settings. *The Journal of Alternative and Complementary Medicine*, 25(7), 753-761.
- O'Mahony, S., Gerhart, J. I., Grosse, J., Abrams, I., & Levy, M. M. (2015). Posttraumatic stress symptoms in palliative care professionals seeking mindfulness training: Prevalence and vulnerability. *Palliative Medicine*, 30(2), 189-192.
- Onan, N., Isil, O., & Barlas, G. Ü. (2013). The effect of a new coping intervention on stress and burnout in turkish oncology nurses. *Journal of Marmara University Institute of Health Sciences*, 3(3), 121-130.
- Ortega-Campos, E., Vargas-Román, K., Velando-Soriano, A., Suleiman-Martos, N., Cañadas-de la Fuente, G. A., Albendín-García, L., & Gómez-Urquiza, J. L. (2020). Compassion Fatigue, Compassion Satisfaction, and Burnout in Oncology Nurses: A Systematic Review and Meta-Analysis. *Sustainability*, 12(1), 72-83.
- Pakenham, K. I. (2015). Investigation of the utility of the acceptance and commitment therapy (ACT) framework for fostering self-care in clinical psychology trainees. *Training and Education in Professional Psychology*, 9(2), 144-152.
- Plumb, J. C., Stewart, I., Dahl, J., & Lundgren, T. (2009). In search of meaning: Values in modern clinical behavior analysis. *Behavior Analyst*, 32(1), 85-103.
- Potter, P., Deshields, T., Berger, J. A., Clarke, M., Olsen, S., & Chen, L. (2013). Evaluation of a compassion fatigue resiliency program for oncology nurses. *Oncology Nursing Forum*, 40(2), 180-187.
- Potter, P., Deshields, T., Divanbeigi, J., Berger, J., Cipriano, D., Norris, L., & Olsen, S. (2010). Compassion fatigue and burnout: prevalence among oncology nurses [Online exclusive]. *Clinical Journal of Oncology Nursing*, 14(5), E56-E62.
- Poulsen, A. A., Sharpley, C. F., Baumann, K. C., Henderson, J., & Poulsen, M. G. (2015). Evaluation of the effect of a 1-day interventional workshop on recovery from job stress

- for radiation therapists and oncology nurses: A randomised trial. *Journal of Medical Imaging and Radiation Oncology*, 59(4), 491-498.
- Powers, M. B., Zum Vörde Sive Vörding, M. B., & Emmelkamp, P. M. (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and Psychosomatics*, 78(2), 73-80.
- Puolakanaho, A., Tolvanen, A., Kinnunen, S. M., & Lappalainen, R. (2020). A psychological flexibility-based intervention for burnout: A randomized controlled trial. *Journal of Contextual Behavioral Science*, 15, 52-67.
- Raab, K. (2014). Mindfulness, self-compassion, and empathy among health care professionals: a review of the literature. *Journal of Health Care Chaplaincy*, 20(3), 95-108.
- Raingruber, B., & Wolf, T. (2015). Nurse perspectives regarding the meaningfulness of oncology nursing practice. *Clinical Journal of Oncology Nursing*, 19(3), 292-296.
- Reeve, A., Tickle, A., & Moghaddam, N. (2018). Are acceptance and commitment therapy-based interventions effective for reducing burnout in direct-care staff? A systematic review and meta-analysis. *Mental Health Review Journal*, 23(3), 131-155.
- Reynolds, S. (2000). Interventions: what works, what doesn't? *Occupational Medicine*, 50(5), 315-319.
- Richardson, D. A., Hug, E., Jesse, M., Connors, K., & Schwartz, K. (2015). The relationship between compassion and psychological flexibility in medical students. *Obstetrics & Gynecology*, 126, 45S. doi: 10.1097/01.AOG.0000471070.21664.1e.
- Richardson, K. M., & Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: a meta-analysis. *Journal of Occupational Health Psychology*, 13(1), 69-93.
- Roxburgh, M. (2006). An exploration of factors which constrain nurses from research participation. *Journal of Clinical Nursing*, 15(5), 535-545.
- Ruiz, F. J. (2010). A review of acceptance and commitment therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology and Psychological Therapy*, 10(1), 125-162.
- Ryan, P., & Lauver, D. R. (2002). The efficacy of tailored interventions. *Journal of Nursing Scholarship*, 34(4), 331-337.
- Sherman, A.C., Edwards, D., Simonton, S., & Mehta, P. (2006). Caregiver stress and burnout in an oncology unit. *Palliative & Supportive Care*, 4(1), 65-80.
- Stoddard, J. A., & Afari, N. (2014). *The big book of ACT metaphors: a practitioner's guide to experiential exercises and metaphors in Acceptance and Commitment Therapy*. New Harbinger Publications.
- Street, L. L., & Luoma, J. B. (2002). Control groups in psychosocial intervention research: ethical and methodological issues. *Ethics & Behavior*, 12(1), 1-30.

- Strosahl, K., Robinson, P., & Gustavsson, T. (2012). *Brief interventions for radical change: Principles and practice of focused acceptance and commitment therapy*. New Harbinger Publications.
- Toh, S. G., Devi, M. K., & Ang, E. N. K. (2011). A systematic review on the relationship between the nursing shortage and nurses' job satisfaction, stress and burnout levels in oncology/haematology settings. *The JBI Database of Systematic Reviews and Implementation Reports*, 9(39), 1602-1649.
- Udo, C., Danielson, E., Henoeh, I., & Melin-Johansson, C. (2013). Surgical nurses' work-related stress when caring for severely ill and dying patients in cancer after participating in an educational intervention on existential issues. *European Journal of Oncology Nursing*, 17(5), 546-553.
- van Mol, M. M., Kompanje, E. J., Benoit, D. D., Bakker, J., & Nijkamp, M. D. (2015). The prevalence of compassion fatigue and burnout among healthcare professionals in intensive care units: a systematic review. *PLOS one*, 10(8), e0136955.
- Van Rooyen, D., Le Roux, L., & Kotzé, W. J. (2008). The experiential world of the oncology nurse. *Health SA Gesondheid*, 13(3), 18-30.
- Villani, D., Grassi, A., Cognetta, C., Cipresso, P., Toniolo, D., & Riva, G. (2013). The effects of a mobile stress management protocol on nurses working with cancer patients: a preliminary controlled study. *Psychological Services*, 10(3), 315-322.
- Walczak, J. R., McGuire, D. B., Haisfield, M. E., & Beezley, A. (1994). A survey of research-related activities and perceived barriers to research utilization among professional oncology nurses. *Oncology Nursing Forum*, 21(4), 710-715.
- Wallace, J. E., Lemaire, J. B., & Ghali, W. A. (2009). Physician wellness: a missing quality indicator. *The Lancet*, 374(9702), 1714-1721.
- Walser, R. D., & Pistorello, J. (2004). ACT in group format. In *A practical guide to Acceptance and Commitment Therapy* (pp. 347-372). Springer US.
- Watanabe, N., Horikoshi, M., Shinmei, I., Oe, Y., Narisawa, T., Kumachi, M., ... & Furukawa, T. A. (2019). Brief mindfulness-based stress management program for a better mental state in working populations - happy nurse project: a randomized controlled trial. *Journal of Affective Disorders*, 251, 186-194.
- Wazqar, D. Y. (2019). Oncology nurses' perceptions of work stress and its sources in a university-teaching hospital: A qualitative study. *Nursing Open*, 6(1), 100-108.
- Wells-English, D., Giese, J., & Price, J. (2019). Compassion Fatigue and Satisfaction: Influence on Turnover among Oncology Nurses at an Urban Cancer Center. *Clinical Journal of Oncology Nursing*, 23(5), 487-493.
- Wenzel, J., Shaha, M., Klimmek, R., & Krumm, S. (2011). Working through grief and loss: oncology nurses' perspectives on professional bereavement. *Oncology Nursing Forum*, 38(4), 272-282.

- Wiklund Gustin, L., & Wagner, L. (2013). The butterfly effect of caring—clinical nursing teachers' understanding of self-compassion as a source to compassionate care. *Scandinavian Journal of Caring Sciences*, 27(1), 175-183.
- Wilson, K. G., Sandoz, E. K., Kitchens, J., & Roberts, M. (2010). The Valued Living Questionnaire: Defining and measuring valued action within a behavioral framework. *The Psychological Record*, 60(2), 249-272.
- Wyatt, D., & Hulbert-Williams, N. (2015). *Cancer & Cancer Care*. London: Sage Ltd.
- Zadeh, S., Gamba, N., Hudson, C., & Wiener, L. (2012). Taking care of care providers: a wellness program for pediatric nurses. *Journal of Pediatric Oncology Nursing*, 29(5), 294-299.